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But this cannot be confounded with the question of origin. On this point the Darwinian is on the same footing as the old time Creationist. The latter says God made the variations, and the Darwinian says that they came by chance. Between these positions science can perceive nothing to choose.—C.

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RECENT LITERATURE.

THE DEVELOPMENT OF AMPHIOXUS BY HATSCHKE.¹—The entire organic world does not contain a more interesting animal than the lancelet, *Amphioxus* or *Branchiostoma*, the lowest vertebrate, the link which, though far removed from either, indicates a common origin, or at least a remarkable structural similarity between the Vertebrata and the Ascidians or Tunicates.

The literature upon this creature, extensive but incomplete, is now enriched by the present exhaustive memoir by one of the most careful and accurate of European biologists. In this memoir, which forms the greater portion of a late issue of the *Arbeiten* of the Zoölogical Institute of the University of Vienna, and is illustrated by nine large plates, carefully drawn and colored, the development of the lancelet is traced with the greatest minuteness from the ovum to the adult. The ovum of *Amphioxus* contains, between the germinal portion and the enclosing membrane a remarkably large water space, forming by far the greater portion of its bulk, and the cleavage is very near regular, the difference between the size of the cells separated by the first equatorial fissure being very small. The "blastula" stage with its large segmentation cavity, and the gradual formation of a "gastrula," are abundantly illustrated; two plates are devoted to the more advanced development, plainly showing the hollow structure and alternate position of the muscle-plates or myocommas, and three colored plates are filled with transverse sections.

Until an advanced period of embryonic life, the digestive tract is continuous with a dorsal canal, which terminates at an opening upon the upper surface of the head. At a later period the vent is formed, connection between the digestive tract and the dorsal canal is cut off, the anterior opening closes, and the dorsal canal becomes the neural canal.

The hollow form of the muscular segments is shared by the lancelet with the Selachians (sharks and rays), Cyclostomes (hags and lampreys) and Batrachia, and tends to prove their primary origin as diverticula from the digestive cavity.

In the notochord vacuoles are developed, which become larger,

¹ *Studien über Entwicklung der Amphioxus*. Von B. HATSCHKE, pp. 88. 9 double 8vo plates. *Arbeiten aus Zool. Inst. Univ. Wien und der Zool. Station in Triest*. Tom IV. 1 Heft, 1881.

obliterating the structure of the original notochordal cells, until finally the notochord consists of a series of clear spaces separated by hyaline partitions. These vacuoles are traceable also in tunicates, and in the teleosts or bony fishes.

In conclusion, we have to say that Hatschek has given to the world a most valuable addition to its stock of embryological knowledge.

TROUESSART'S CATALOGUE OF RECENT AND FOSSIL MAMMALS.¹—Catalogues of animal forms are as necessary to a student of zoölogy as are catalogues of books to the frequenters of a library, or directories to dwellers in cities. No zoölogist can carry in his brain, ready at an instant's notice, the accepted name, synonymy, etc., of all the species included in the department he specially studies, and thus such works as Gray's Hand-List of Birds, and the present are great boons to him; they save him hard work, and leave him free to exercise his mind upon purely scientific work.

Dr. Trouessart's catalogue, which has already progressed to the completion of the Primates and Rodentia promises to be to mammalogists what Gray's Hand-List is to ornithologists, with the added recommendation that it contains also all known species of fossil mammals, and will therefore prove equally useful to the palæontologist.

The classification adopted is to a great extent that of modern authors with the addition of the orders proposed by Professor Cope, and is based upon the structure of the feet and teeth, except in the division of all mammalia into the universally accepted sub-classes Monodelphia (placental) and Didelphia (non-placental).

The Prosimiæ (Lemurs) are separated as an order from the Simiæ; Cope's order Bunotheria, with four extinct sub-orders (*Mesodonta*, *Creodonta*, *Tillodonta*, *Tæniodonta*), and one recent sub-order (Insectivora), is placed among the *Secundates*, or unguliculates; the Toxodonta are considered a sub-order of Rodentia, and the Zeuglodonta has the same rank among the Pinnipedia. The line of hoofed animals or *Ternates* is concluded by the *Amblypoda*, with two sub-orders, *Dinocerata* and *Pantodonta*; the porcine group is separated as a sub-order from the ruminants, and the order Sirenia is intercalated between the Edentata and the Cetacea. The last mentioned three orders form the group *Homodonta*, of equal rank with the Heterodonta, which includes the remaining monodelphian orders.

The catalogue gives, besides genera, sub-genera, and species, the habitat, the synonymy, and all varieties on which species have been founded. When these varieties are merely local, or perhaps based on individual characters, they are marked with the

¹ *Catalogue des Mammifères Vivants et Fossiles.* Par le DR. E. L. TROUESSART. June, 1878.